

Kaempferia sawanensis (Zingiberaceae), A New Species from Southern Laos

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Abstract: A new species of *Kaempferia* from Southern Laos, *K. sawanensis*, is described and illustrated. Relationship of this new species with other taxa is discussed.

Key words: New species; *Kaempferia sawanensis*; Zingiberaceae; Southern Laos

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Establishing correct botanical names for medicinal plants is essential for further drug development, i.e. quality assessment, safety, and efficacy studies. In continuation of our work to clarify taxonomically the botanical origins of several medicinal plant drugs used ethnopharmacologically in Thailand, we have to extend our work to our neighbours, particularly Laos. Several taxa are native to both Northeast Thailand and Laos (Picheansoonthon and Koonterm, 2008a). Some taxa previously supposed to be endemic to Thailand have recently been recorded in Laos (Picheansoonthon and Koonterm, 2008a). Therefore taxonomic decision on any Thai specimens, especially those from Northeastern Thailand adjacent to Laos, would be precise and reliable after investigating and comparing with those of the corresponding Laotian specimens.

Of the sixteen *Kaempferia* species enumerated for Thailand, at least thirteen taxa are native to northeast Thailand and at least ten species can be found along the Thai-Laos border (Picheansoonthon and Koonterm, 2008a). Thirteen species were listed for Indochina (Gagnepain, 1908). Some taxa in that treatment are now referred to other genera. Recently, eight taxa were included in a checklist of the vascular plants of Lao PDR (Newman *et al.*, 2007): *K. angustifolia* Roscoe,

K. elegans (Wall.) Baker, *K. fallax* Gagnep., *K. fissa* Gagnep., *K. galanga* L., *K. harmandiana* Gagnep., *K. laotica* Gagnep., and *K. rotunda* L.

During our intensive fieldwork in Laos with the aim to investigate the living specimens of some key *Kaempferia* species from their type locations, we have encountered several undescribed species, four of which have been recently reported: *K. chayanii* Koonterm (Koonterm, 2008), *K. champasakensis* Picheans. & Koonterm (Picheansoonthon and Koonterm, 2008b), *K. gigantiphylla* Picheans. & Koonterm, *K. attapeuensis* Picheans. & Koonterm (Picheansoonthon and Koonterm, 2009). In this paper another beautiful species found in the restricted remote mountain in Sawanakhet Province of Southern Laos, near the Vietnamese border, is recognized. This species is, therefore, the fifth taxon added to the eight species listed (Newman *et al.*, 2007).

Kaempferia sawanensis Picheans. & Koonterm,
sp. nov. Figs. 1 - 2

Etymology: The epithet is referred to Sawanakhet (literary means "land of heaven"), one of the southern provinces of Lao PDR, where the type location situated. The province is also locally called as "Sawan", which means "heaven".

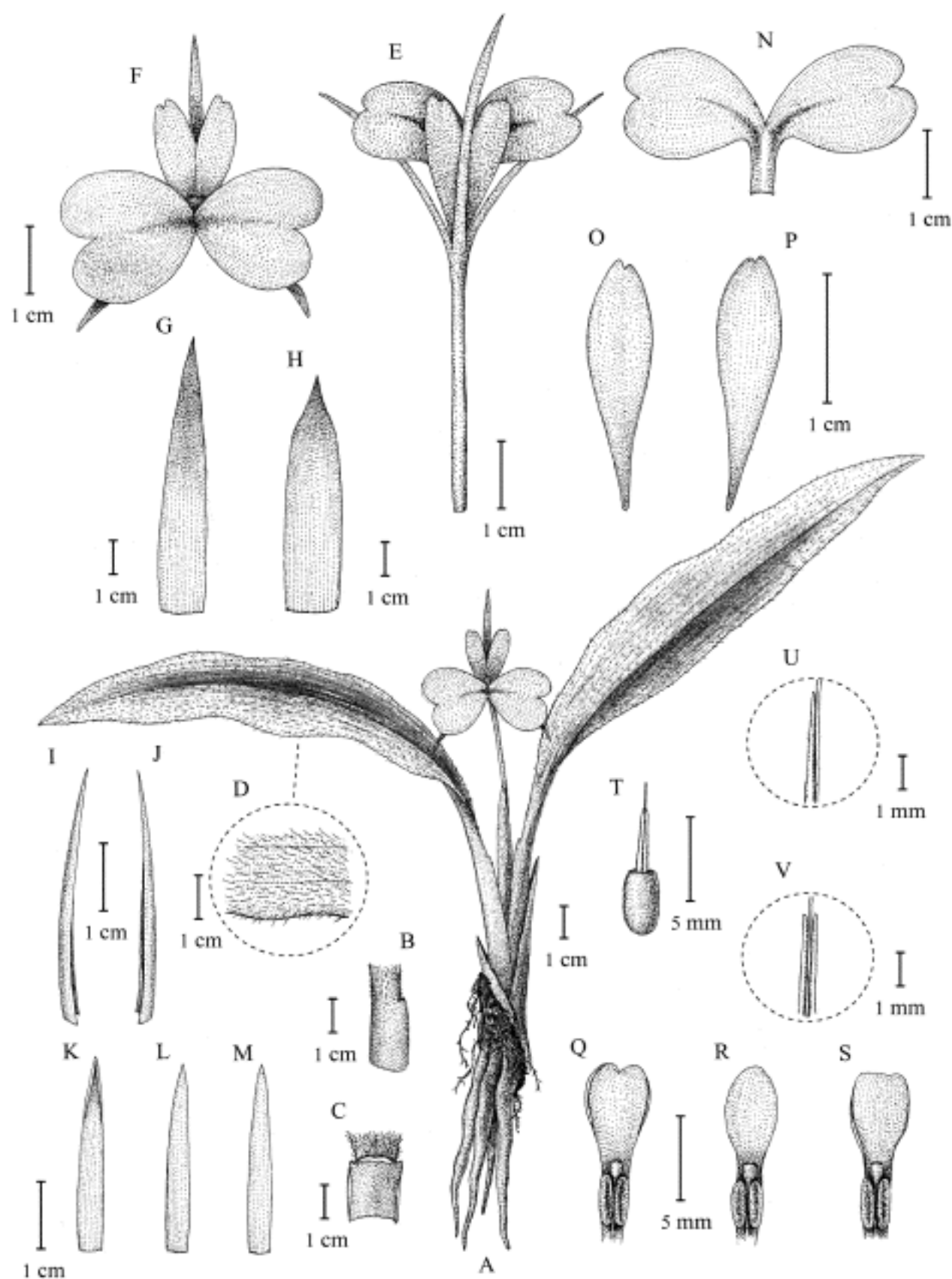


Fig. 1 *Kaempferia sawanensis* Pichens & Koonterm

A . the plant habit; B . & C . ligule (B . side view, C . front view); D . upper leaf surface; E . & F . a flower (E . rear view, F . top view); G . & H . bracts, I . & J . bracteoles; K . dorsal corolla lobe; L . & M . lateral corolla lobes; N . labellum; O . & P . lateral staminodes; Q . R . & S . anthers, stigma and various forms of anther crests; T . ovary with part of the style and the stylodes; U . & V . stylodial glands (U . side view, V . front view) . Drawn from living specimens by Chalermchoke Boonchit

Type: *Picheansoonthon* & *Koonterm* 016, Lao PDR, Sawanakhet Province, Phin Town, Dong Phuo Vieng NPA, N 16°30.457 E 106°01.446, alt. 288 m, 26 April 2007 (holotype BKF, isotypes BK, SING)

Kaempferia larsenii Siriruga similis, sed rhizomatibus ovoideofusiformibus, radicibus tuberosis gracilibus ad fusiformibus, foliis subsessilibus vel petiolis ad 5 mm longis pubescentibus, foliis utrinque pubescenti-

bus marginibus parum undulatis, apicibus non cuculatis, pedunculis subsessilibus ad 2.3 cm longis, bracteis lanceolatis ad oblongis pubescentibus differt.

Small perennial herb. Rhizome short, ovate-fusiform. Roots tuberous, slender. Leaves 2 - 3 (- 4), radical; blade elliptic to oblong 9.5 - 17.8 by 2.3 - 11.2 cm, apex acute, base cuneate, margin slightly undulate, both surfaces pubescent, upper surface dark

green, lower pale green; petioles sessile to subsessile (to *ca.* 5 mm long), pubescent; leaf sheaths 3.4 - 7.2 cm long, bladeless sheath 2.9 - 5.7 cm long; ligule broadly triangular *ca.* 1 mm long, glabrous. Inflorescence subsessile (to *ca.* 2.3 cm long), rising between the two innermost leaves. Flowers 5 - 12; bracts lanceolate to oblong, 3.4 - 9.2 by 1.2 - 2.8 cm, base pale green but darker toward the apex, pubescent; bracteoles linear 3.2 - 4.7 cm long; calyx tube pale yellow, 4.1 - 5.7 cm long, divided along one side,

apex bi-trifid, glabrous; corolla tube pale yellow, 6.7 - 12.3 cm long, dorsal corolla lobe pale yellow, elliptic-oblong, 2.4 - 2.7 cm by 5 - 7 mm, apex hooded, lateral corolla lobe pale yellow, elliptic, 2.4 - 2.5 cm by 4 - 5 mm, apex acute; staminodes violet, darker at base, obovate, 2 - 2.5 by 0.5 - 2.1 cm, apex rounded or emarginate; labellum divided to the base, violet, darker at base, each lobe obovate 1.8 - 2.7 by 1.5 - 3.2 cm, apex emarginate; stamen sessile, anther 2 - 3 mm long, anther crest violet, obovate or rectangular or



Fig. 2 *Kaempferia sawanensis* Pichans . & Koonterm

A . The plant habit; B . The plants in its type locality; C . Detail of the flowers . Photographed by Chayan Pichansoonthon

suborbicular, 3 - 5 by 2 - 4 mm, the apex rounded, entire or slightly crenate; ovary *ca.* 3 by 1 mm, glabrous, trilocular, placentation axile, ovules numerous, stylodes 2, filiform, *ca.* 2.5 - 3 mm long.

Distribution: Laos PDR (Sawannaket Province, Phin Town, Dong Phou Vieng National Protected Area)

Ecology: It grows in sandy soil along dry evergreen forest and pine-deciduous dipterocarp forest.

Note: The genus found in Lao PDR can be divided into two main groups, the *K. rotunda*-group [the inflorescence appears before the leaves] and the *K. galanga*-group [the inflorescence occurs after the leaf(s)]. This new species belongs to the second group. There are so far only 4 species native to Laos in the second group known to be few-leaved herbs with pure violet or purple flowers: *K. harmandiana* Gagnep., *K. larsenii* Sirirugsa, *K. attapeuensis* Pichens & Koonterm and *K. sawanensis*. From the other three species, *K. sawanensis* can be readily distinguished by its hairiness of most parts, especially both sides of the leaves.

Members of the genus *Kaempferia* generally have fibrous root systems with globular or sub-globular to fusiform storage tubers. The roots of this new species, however, is characteristic of the *Kaempferia* group with either small staminodes relative to the labella lobes (*K. chayanii* Koonterm) or missing staminodes (*K. spoliata* Sirirugsa and *K. sisaketensis* Pichens & Koonterm).

It is worth to note that 3 other *Kaempferia* species, *K. laotica* Gagnep., *K. harmandiana* Gagnep. and *K. fissa* Gagnep., are present in the type location of *K. sawanensis*. The populations of *K. laotica* and *K. harmandiana* in the type location, however, are relatively small comparing with *K. fissa*. The latter taxon is greatly varied in length of the leaves and anther connectives and can't be differentiated from *K. filifolia* K. Larsen seen in its type location at Phu Wat (Phu Sa Dok Bua NP, Changwat Muekdahean, Thailand) or at several locations in Northeast Thailand and Southern Laos.

The following key includes the species found in the proximity of the type location.

1. Flowers pure white, night-bloomed; leaves filiform
..... *K. fissa*
1. Flowers not pure white, day-bloomed; leaves not filiform
..... 2
2. Lower and upper leaf surfaces hairy *K. sawanensis*
2. Lower leaf surface hairy, upper surface glabrous 3
3. Leaves petiolate *K. harmandiana*
3. Leaves sessile *K. laotica*

Conservation status: This new species is considered rare since its large population can so far only been found in the type location. Few smaller populations in the proximity of the type location can also be seen. Its type location is well protected in Dong Phou Vieng National Protected Area (Sawannaket Province, Lao PDR).

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References:

- Gagnepain F, 1908. Zingibéracées [A]. In: Lecomte MH ed. Flora Générale de L Indochine [M]. Paris: Masson et C^{ie}, 6: 45—54
- Koonterm S, 2008. *Kaempferia chayanii* (Zingiberaceae), a new species from southern Laos [J]. *Folia Malasiana*, 9 (1): 17—22
- Newman M, Ketphanh S, Svengsuksa B *et al.*, 2007. A Checklist of the Vascular Plants of Laos PDR [M]. Edinburgh: Royal Botanic Garden Edinburgh, 364—365
- Pichensoonthon C, Koonterm S, 2008a. Notes on the genus *Kaempferia* L. (Zingiberaceae) in Thailand [J]. *Journal of Thai Traditional & Alternative Medicine*, 6 (1): 27—51
- Pichensoonthon C, Koonterm S, 2008b. A new species of *Kaempferia* (Zingiberaceae) from Southern Laos [J]. *Taiwania*, 53 (4): 406—409
- Pichensoonthon C, Koonterm S, 2009. Two new species of *Kaempferia* (Zingiberaceae) from Southern Laos [J]. *Taiwania*, 54 (2): 219—225